Farm Pesticide Storage Facility

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Factsheet

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(replaces OMAFRA Factsheet *Pesticide Handling Facility*, Order No. 94-037)

Pesticides are chemical and biological products — herbicides, insecticides, fungicides, rodenticides, miticides, etc. — that are used to kill and/or control pests.

PESTICIDE STORAGE SAFETY

Significant amounts of pesticides are used in the agricultural industry. It is essential that all pesticides be stored properly and safely on farms today. Under the *Pesticides Act*, R.S.O. 1990 and Regulation 914, it is illegal to store pesticides under unsafe conditions.

This Factsheet describes key requirements from the regulations and other factors to consider when planning a pesticide storage facility for your farm.

STORAGE REQUIREMENTS

Separate storage structure

Purchase a prefabricated pesticide storage (Figure 1) or construct a separate structure that will be used exclusively for the storage of pesticides. Plan drawings for constructing your own storage begin on page 3.

Schedule 1 and 5 pesticides must have their own clearly defined portion of the pesticide storage area, such as a separate shelf or segregated location within the storage, or an identified portion of a shelf or compartment.

Figure 1. A prefabricated pesticide storage. (Photo courtesy of Brooklin Concrete Inc., www.brooklin.com)

All scheduled pesticides must be stored so that they:

- will not impair health or safety
- will not have any contact with food and drink intended for human or animal consumption
- will not contaminate the natural environment or any other pesticides stored in the same area

A separate, free-standing building is the most desirable storage. If the pesticide storage facility is constructed within another building, it is recommended that interior separation walls and ceilings of the pesticide storage have a fire resistance rating of not less than 1 hour.

Ventilation

The storage area must be ventilated to the outside. Either a natural or mechanical ventilation system may be used to exhaust fumes from the storage.

Access

The door leading to the storage area must be locked to control access and prevent unauthorized entry. Ideally, accessibility to the storage is from outdoors only.

Signage

The pesticide storage area must have a warning sign prominently displayed at the entrances bearing, in clearly visible, block letters, the words:

- "Warning"
- "Authorized Persons Only" and
- "Chemical Storage" or "Pesticide Storage"

Emergency telephone numbers must be displayed in a prominent location near where the pesticides are stored and include numbers for hospital, ambulance, physician, poison control centre, fire department, police and the Ministry of the Environment Spills Action Centre. (A chemical storage warning sign is available from the Farm Safety Association at 1-800-361-8855.)

Ministry of Agriculture, Food and Rural Affairs

Ontario

Figure 2. Example of a chemical storage warning sign.

Floor

The storage should have an impervious floor, i.e., sealed concrete, with no floor drains that lead into or drain directly or indirectly into a storm sewer, sanitary sewer or watercourse (a floor drain to a wholly contained holding tank is acceptable) and with a curb around the entire floor perimeter of the storage facility to contain any spills.

The curb should be high enough to contain a spill from the largest container in the storage; the minimum curb height above the storage floor elevation is 50 mm (2 in.).

Insulation

The storage area should include an insulated and heated compartment for any chemicals that require protection from freezing.

Volatile product storage

Store insecticides, herbicides and fungicides apart from each other in the facility. Store herbicides and other volatile products in a tightly sealed container or in a separate area.

Protective clothing

Ensure that protective clothing and adequate respiratory equipment are readily available and stored so that it does not become contaminated, e.g., in polyethylene bags or in an adjacent room or structure.

Pesticide labels

All pesticides must be stored in their original containers with a legible label that clearly indicates their Pest Control Products (PCP) registration number, the list of active ingredients and their concentrations.

Clean-up materials

Ensure that enough absorbent material (such as sawdust, kitty litter, soil or rags) is available to clean up any spills or leaks from containers.

PESTICIDE STORAGE STRUCTURES

Pesticide storages may be purchased as modular units (Figure 1). The requirements under the *Pesticides Act*, R.S.O. 1990 can be incorporated into these units, which are available in various sizes, up to approximately 9.3 m^2 (100 ft^2) in floor area.

Farmers wishing to construct their own can base their storages on the detailed plans contained in this Factsheet. This 2,440 mm x 3,650 mm (8 ft x 12 ft) wood frame, steel-clad storage incorporates the storage requirements included under the *Pesticides Act*, R.S.O. 1990 and can be constructed on-site. Before construction begins, contact the Chief Building Official in your municipality regarding any Building Code or siting requirements that may apply.

The plan calls for a non-insulated structure. For this type of storage, natural ventilation through the sidewall and gable soffits is used. For non-insulated storages, provide at least 0.55 m^2 (6 ft^2) of total inlet and exhaust area per 9.3 m^2 (100 ft^2) of building floor area. An insulated cabinet with low-wattage electric bulbs provides winter storage for chemicals susceptible to freezing. The stored items must not come in contact with the bulbs.

For insulated storages, mechanical ventilation is often used. The goal with mechanical ventilation is to provide ¼ to ½ air changes per minute. A 20–25 cm (8–10 in.) diameter exhaust fan will normally do the job. For a storage having a floor area of 9.3 m^2 (100 ft^2), i.e., 2,440 mm x 3,650 mm (8 ft x 12 ft), the inlet size should be 225–450 cm^2 (35–70 $in.^2$) to attain an inlet velocity of 250 m/min (800 ft/min) for the ¼ and ½ air changes per minute, respectively.

The air should enter the building through a narrow slot along one side of the building with the fan on the other side. Install a switching system so that the fan can be turned on manually prior to entry. A timer on the fan will allow stale air to be removed on a regular basis.

An anteroom with a separate outside entrance provides a non-contaminated area for storage of safety equipment and clothing that is completely sealed off from the storage section and ventilates separately through the soffits.

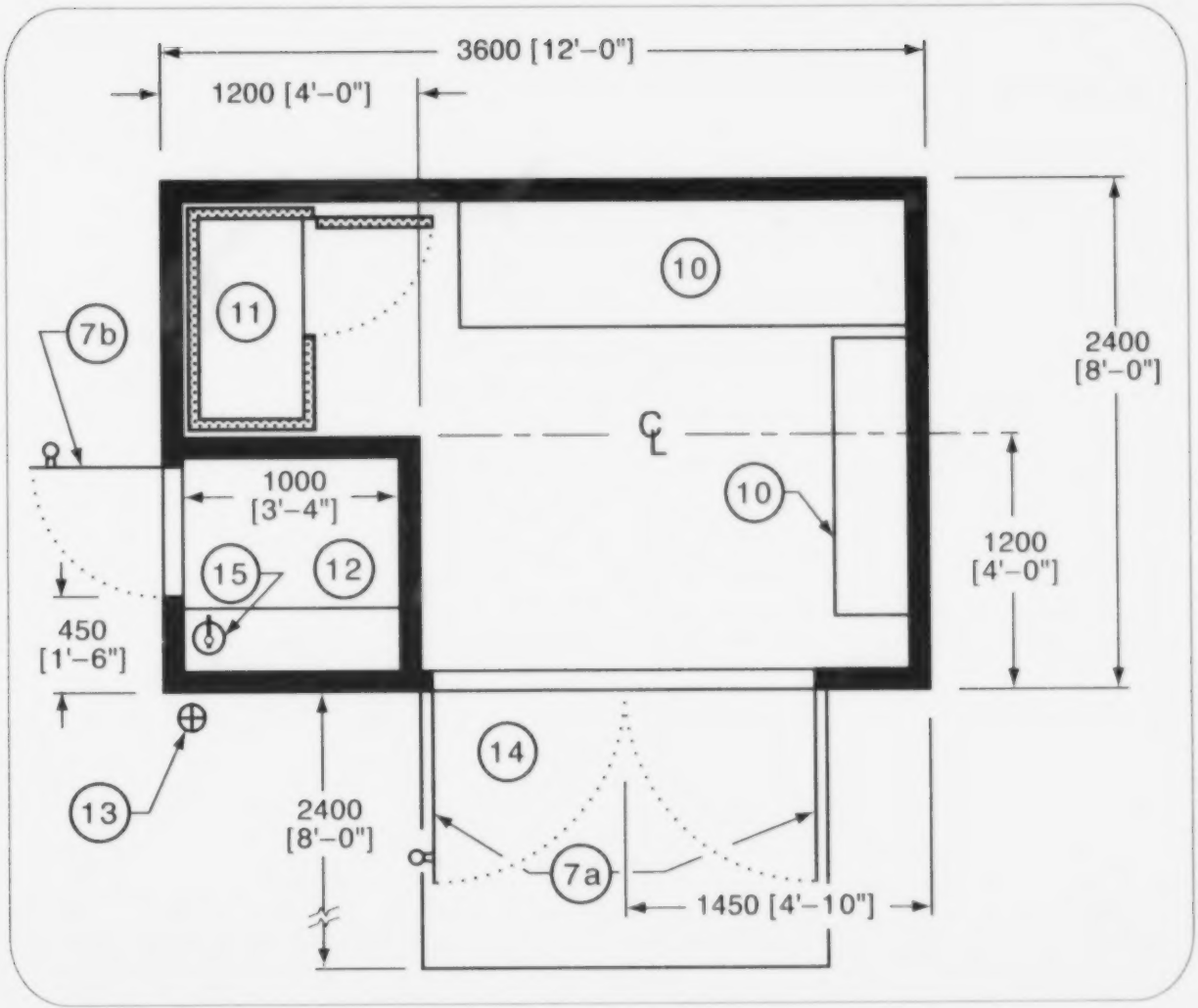

Figure 3. Floor plan (dimensions are in mm [ft–in.]).

Site location

- Locate the building on dry stable surfaces where flooding will not occur.
- Grade the facility around the perimeter so that roof drainage flows freely away from the building.
- Locate the building so that water contamination is unlikely, e.g., on a slope of surrounding land, at a minimum separation distance of 60 m (200 ft) from dwellings and 90 m (300 ft) from surface water and wells.
- Locate a mixing area adjacent to the storage that is designed to contain any spilled material, preventing contamination of surface and/or groundwater supplies.

STRUCTURAL FEATURES

The circled numbers in Figures 3, 4 and 5 refer to the features for the pesticide storage facility described here.

Base (1)

Remove top soil and prepare the base with 150-mm (6-in.) deep compacted granular fill (Granular A).

Floor (2)

Install a floating concrete slab and a curb formed in one placement, using:

- 25 MPa (3,600 psi) concrete
- a water/cementing materials ratio of 0.55
- 14–20 mm (½–¾ in.) aggregate
- 5%–8% air entrainment

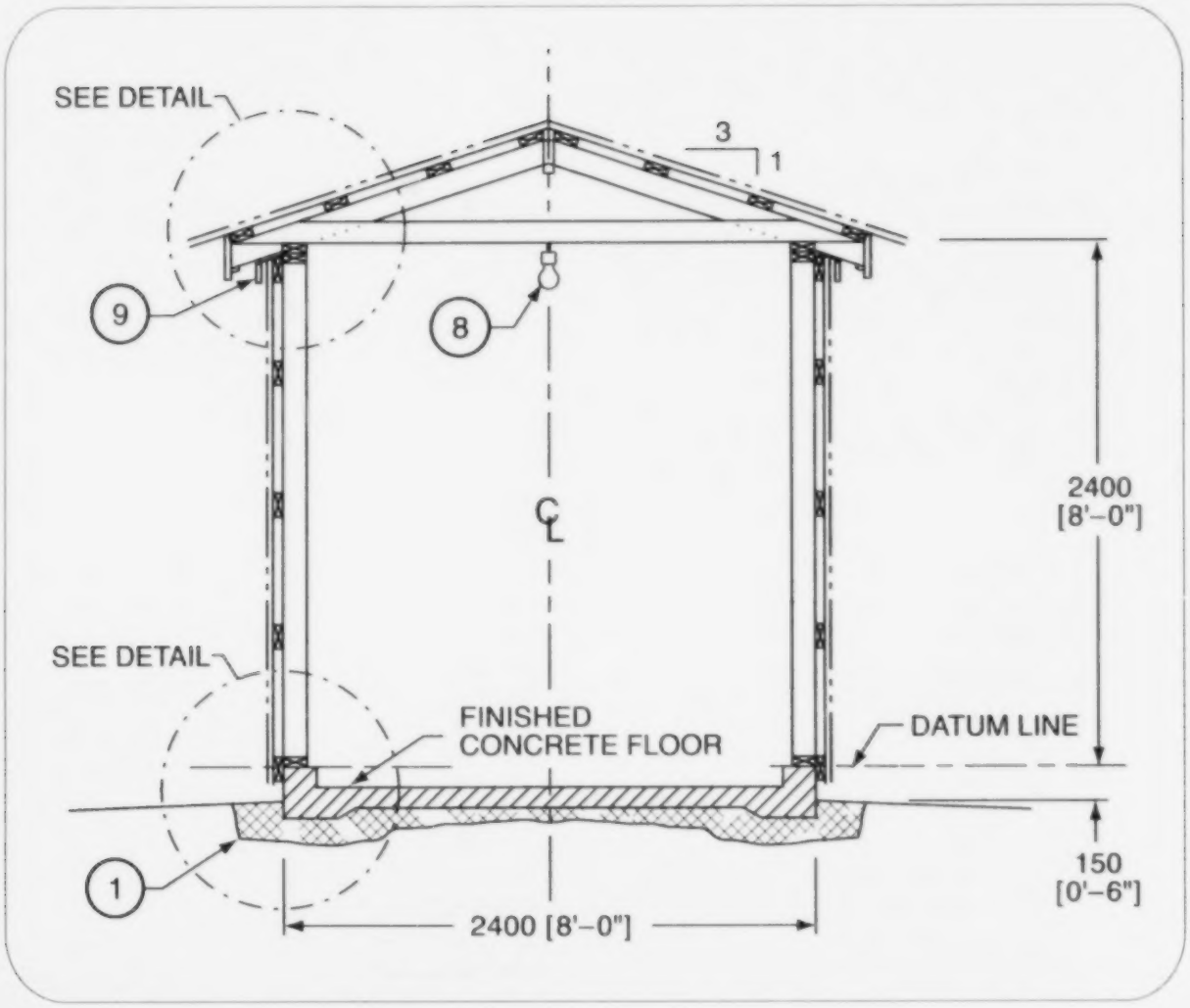

Figure 4. Cross-section of pesticide storage (dimensions are in mm [ft–in.]).

The slab should be 125 mm (5 in.) thick and the curb 90 mm (3½ in.) high. Curb height is continuous around the perimeter of the slab (including doorways and common walls of anteroom).

Reinforcing Rods (3)

Use 10 mm (½ in.) diameter rods at 600 mm (24 in.) O.C. in both directions, bent up into the concrete curb.

Anchor Bolts (4)

Use 12 mm x 150 mm (½ in. x 6 in.) bolts at 1,200 mm (4 ft) O.C. to secure the base plate.

Walls (5)

Use non-insulated stud wall construction using 28-gauge corrugated steel cladding, applied vertically on the outside walls. No interior sheathing is required except for the common walls between the anteroom and the storage area (see **Anteroom**, page 6).

Roof (6)

Check the Ontario Building Code for local live loads and dead loads to assure the structural adequacy of the rafters/trusses at a given spacing.

Roof Types

- simple rafter or roof truss with nailing girts and 28-gauge corrugated steel cladding
- asphalt shingles nailed to 12-mm (½-in.) Douglas fir exterior sheathing plywood

NOTE: Use light-coloured roofing to reduce heat build-up.

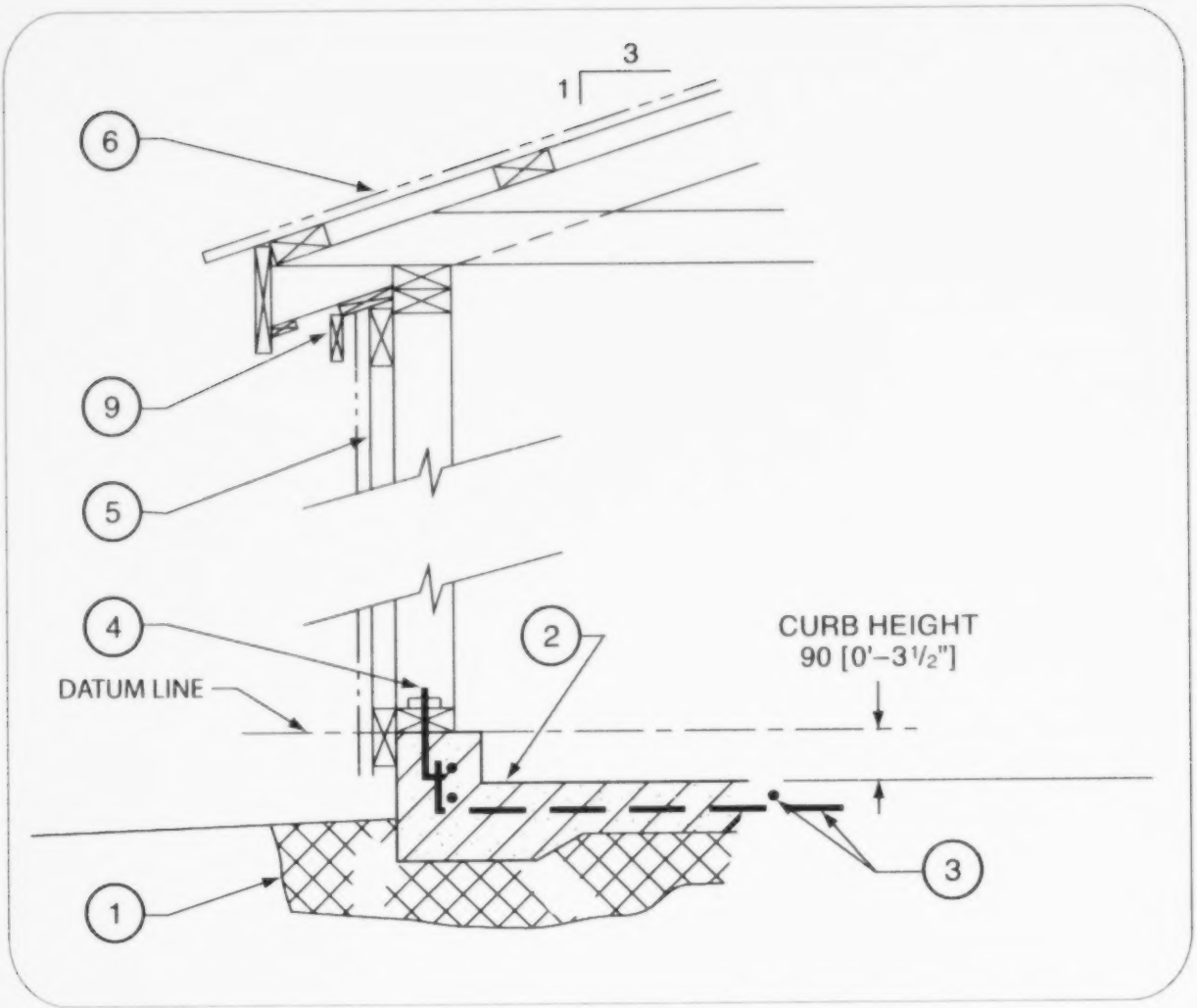

Figure 5. Details for construction (dimensions are in mm [ft–in.]).

Doors (7)

For improved resistance against vandalism, rodent/pest damage and weathering, use:

- (7a) two 900 mm x 2,000 mm (36 in. x 80 in.) and
- (7b) one 600 mm x 2,000 mm (24 in. x 80 in.) outward-opening, exterior-type galvanized steel doors, or wood doors with exterior metal cladding attached

Lighting (8)

Mount light fixtures (pig-tail type) with 60-watt bulbs onto the bottom chord of the roof truss or rafter, one bulb per room.

Ventilation (9)

Ventilate the storage using:

- sidewall soffit air intakes, both sides, 100 mm (4 in.) clear width x building length
- gable end soffit intakes, both ends, 100 mm (4 in.) clear width x rafter length

Bird-proof all air intakes with 12 mm x 12 mm (½ in. x ½ in.) screen and a 90-mm (3½-in.) hinged closure flap. In the closed position, the closing flap dimension will allow a 12-mm (½-in.) opening for winter ventilation.

Storage Racks (10)

Construct racks above the top of the curb (datum line) so that in the event of an accidental spill or leak, containers are not in direct contact with the floor.

Frost Protection (11)

If you are storing chemicals that are susceptible to freezing, construct an insulated cabinet 600 mm x 900 mm x 1,200 mm (2 ft x 3 ft x 4 ft), or sized to suit, heated with low-wattage electric bulbs.

OTHER FEATURES

Anteroom (12)

Seal off the anteroom from the adjoining pesticide storage area (for the common wall, utilize a sill gasket between the top of the raised concrete curb and the stud wall plate). Equip the anteroom with hooks or shelves or lockers for the storage of respirators, disposable gloves, coveralls, goggles, first-aid supplies, personal gear, etc.

Continue internal walls in height to the underside of the roof; include a vapour barrier and internal sheathing. Caulk all seams to ensure air isolation from the pesticide storage room. The room can be 1,200 mm x 1,200 mm (4 ft x 4 ft) or to suit. The anteroom will utilize the sidewall and gable end soffits for continuous ventilation.

Hydrant (13)

Locate a frost-free water hydrant outside the building. Install a backflow valve/siphon preventer (self-draining type) on the discharge end of the hydrant.

Ramp (14)

Although not required by the regulations, a ramp can facilitate loading and unloading the storage with a front-end loader. Form a concrete ramp (broom finish) with a finished elevation equal to the top of the curb.

Fire extinguisher (15)

Locate an ABC-type fire extinguisher in close proximity to, but not in, the pesticide storage building.

RESOURCES

OMAFRA Factsheet, *Pesticide Container Rinsing*, Order No. 87-057.

OMAFRA Factsheet, *Pesticide Contamination of Farm Water Supplies*, Order No. 00-099.

OMAFRA Factsheet, *Constructing a Farm Building in Ontario*, Order No. 07-007.

Grower Pesticide Safety Course Manual, Section 15, How to Store Pesticides Safely, University of Guelph, Ridgetown Campus.

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